FROLOV, V.N., inzhener (g. Moskva)

Manufacturing stamped reducers. Stroi. pred. neft. prom. 2 no.3:4-7 Mr '57. (MLRA 10:4)

(Pipe flanges)

FEDOV, V. N.

FEDOV, V.N., inzhener.

Pressing with external supports. Vest.mash. 37 no.9:28-32 S '57.
(MLRA 10:9)
(Forging)

85126

1.1200

S/182/60/000/005/001/006
A161/A029

AUTHOR: Frolov, V.N.

TITLE: Compressing Tubes in Split Dies

PERIODICAL: Kuznechno-shtampovochnoye proizvodstvo, 1960, No. 5, pp. 3 - 6

TEXT: The article deals with cold stamping of tubular parts from tube blanks in split dies consisting of two and of four parts. The deformation process is analyzed and practical technologic recommendations are given. The process has been studied in experiments with tube blanks of "20" steel and a "Shopper" test press. Two curves show the determined dependence of the compression coefficient limit ($K_{o\delta_{2k}} = K_{compr}$) from the $\frac{s}{d}$ ratio (blank wall thickness / blank diameter) for a two-part die and for a four-part die. The dies are shown. A formula was derived for calculating the compression effort (P): $P = m \cdot 2ls\sigma'_T$; where P is the compression effort in kg in the split die; l - tubular blank length in mm; s - initial blank wall thickness in mm; m - a coefficient used in the experiments, equal to 1.7, determined experimentally; σ'_T - yield point of blank material in kg/mm^2, with strengthening by deformation taken into account. (σ'_T value is found by determining the value of the conditional cross section area change during com-

Card 1/2

85126

S/182/60/000/005/001/006
A161/A029

Compressing Tubes in Split Dies

pression (ε), and ε is used for finding σ'_T in the strengthening graph (ε-σ) for the given steel grade. The graphs can be found, for instance, in the book "Elements of Cold Stamping Theory" by L.A. Shofman. Parts that can be produced by compression in split dies are illustrated. The method is also suitable for sizing hollow parts. Giproneftemash has developed a method for stamping pipe elbows in a two-groove bending-compressing die. This die gives bends with sharp angle without ovality. A local protrusion or neck on a tubular part can also be formed in a split die. There are 9 figures.

Card 2/2

FROLOV, V.N., inzh.

Axial corrugated compensator with rings. Khim. i neft. mashinostr. no.2026-30 Ag '64 (MIRA 18:1)

L 64697-65 EWT(m)/EWP(w) EM

ACCESSION NR: AR5012289 UR/0058/65/000/003/D081/D082

33

B

SOURCE: Ref. zh. Fizika, Abs. 3D652

AUTHOR: Frolov, V. N.

TITLE: A procedure for measuring the optical difference in the path of the rays when using the optical polarization method of stress analysis

CITED SOURCE: Tr. Tashkentsk. in-ta inzh. irrigatsii i mekhaniz. s. kh., vyp. 22, 1964, 108-118

TOPIC TAGS: stress analysis, optic method, optic model, light polarization

TRANSLATION: A method is proposed for measuring path difference which is distinguished from Senarmon's method by the absence of the necessity to set the polarization plane for the incident light at a predetermined angle to the directions of the principal axes at every point of the model. All measurements are made at two fixed polarizer positions, which reduces measurement time. V. Z.

SUB CODE: OP, AS ENCL: 00

Card 1/1

L 45312-66 EWT(1)/FCC GW

ACC NR: AR6016282 SOURCE CODE: UR/0269/66/000/001/0027/0027

37
B

AUTHORS: Vasil'yev, O. B.; Frolov, V. N.

TITLE: The calculation of night spectral transparency of the atmosphere by the expedition of the GAO in Zelenchuk in 1963

SOURCE: Ref. zh. Astronomiya, Abs. 1.51.233

REF SOURCE: Izv. Gl. astron. observ. v Pulkove, v. 24, no. 2, 1965, 207-213

TOPIC TAGS: spectrographic analysis, atmospheric transparency

ABSTRACT: Results are presented for preliminary calculations of spectral transparency of the earth's atmosphere. The work is based on the photographic method, and was carried out by the astronomical-climatic expedition of the Main Astronomical Observatory of the Academy of Sciences SSSR in Zelenchuk. Observations were made in the summer of 1963 with the aid of an AZT-7 meniscus Kassegrenovskiy reflector in combination with ASP-9 slit spectrograph. The diameter and focus distance of the telescope were 200 and 2000 mm respectively. Reverse dispersion of the spectrograph was 215 A/mm along the line Hβ. It turned out that the mean coefficient of transparency diminished evenly from 0.84 near the 575 mμ wavelength to 0.65 near the 400 mμ wavelength. Results of the observations are compared with other observations and with meteorological data on the night of the observations. Bibliography of 11 titles. D. Kuli-Zade [Translation of abstract]

SUB CODE: 03, 08

UDC: 525.7

Card 1/1 mjs

FROLOV, V.N.

Determining the coefficient of transverse load ir designing automobile road bridges for torsional strength, taking the rigidity of span structure into account. Trudy TASHIIT no.18:61-67 '61. (MIRA 18:3)

AYUPOV, Kh.V., kand. veter. nauk; IVANOVSKIY, S.A., kand. veter. nauk; SAFIULLIN, G.K.; VALIULLIN, S.M., veterinarnyy vrach; UPORNIKOV, M.V., veterinarnyy vrach; FROLOV, V.P., zootekhnik

Veterinary helminthological evaluation of the year-round pen system of keeping sheep. Veterinariia 40 no.6:49-52 Je '63. (MIRA 17:1)

1. Bashkirskaya nauchno-proizvodstvennaya veterinarnaya laboratoriya (for Frolov). 2. Direktor Miyakinskogo sovkhoza Bashkirskoy ASSR (for Safiullin).

ACC NR: AP6021435 SOURCE CODE: UR/0413/66/000/011/0036/0036

INVENTORS: Frolov, V. P.; Korotayev, A. A.

ORG: none

TITLE: Dynamoelectric convertor frequency regulator. Class 21, No. 182215

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 11, 1966, 36

TOPIC TAGS: frequency control, pulse width modulation, transistorized amplifier

ABSTRACT: This Author Certificate presents a dynamoelectric convertor frequency regulator containing a measuring unit made of LC units and a class D transistor amplifier. Pulse width modulation provides a comparison of the saw-tooth voltage with the reference voltage through the transistor input. To provide independent operation, a rectifier and filter forming the saw-tooth voltage are connected to the secondary winding of the choke of the LC circuit (see Fig. 1). A transformer and rectifier forming the reference voltage are connected to the supply terminals of the LC circuit.

Card 1/2 UDC: 621.316.726

ACC NR: AP6021435

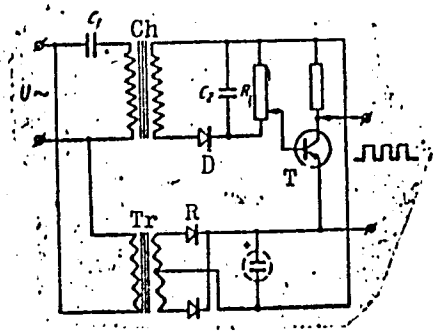


Fig. 1.

Orig. art. has: 1 diagram.

SUB CODE: 09/ SUBM DATE: 090ct62

Card 2/2

DERBAREMDIKER, M.I.; SEREBRENNIKOVA, K.L.; TERNOVSKIY, V.A.; Prinimali uchastiye: SHAROV, P.M.; NOVIKOV, L.Z.; LUR'YE, E.I.; PIS'MEN, M.K.; KARABIN, A.I. [deceased]; KOSTIN, L.I.; FROLOV, V.P.; MEDVEDEV, F.V.; GELIMKHANOV, S.G.; BONDAR', V.G.; TIMOFEYEV, P.I.; MININA, L.V.; ARBEKOV, F.F.; NIKOLAYEV, N.I.; YAROSLAV, T.Ye.; NUDEL'MAN, V.G.

Gasification of mazut under pressure in a steam-oxygen blast. Gaz. prom. 9 no.11:49-50 '64. (MIRA 17:12)

IVTODIY, L.A.; FROLOV, V.P.

The KRN-1,4 rotary cultivator. Trakt. i sel'khozmash. no.6:37-38 Je '65. (MIRA 18:7)

1. Spetsial'noye konstruktorskoye byuro sel'skokhozyaystvennykh mashin Soveta narodnogo khozyaystva Leningradskogo ekonomicheskogo rayona.

FROLOV, V.P.; OGNEV, K.G.

The TPP-6 machine for pressing peat for litter. Trakt. i sel'khozmash. no.6:38 Je '65. (MIRA 18:7)

1. Spetsial'noye konstruktorskoye byuro sel'skokhozyaystvennykh mashin Soveta narodnogo khozyaystva Leningradskogo ekonomicheskogo rayona.

L 44080-66 EWP(k)/EWT(d)/EWT(m)/EWP(w) IJP(c) EM

ACC NR: AP6030747 SOURCE CODE: UR/0198/66/002/008/0112/0119

AUTHOR: Tul'chiy, V. I. (Nikolayev); Frolov, V. P. (Nikolayev); Yakimovich, G. I. (Nikolayev)

ORG: Nikolayev Shipbuilding Institute (Nikolayevskiy korablestroitel'nyy institut)

TITLE: Plate with a circular hole reinforced by a composite ring or an elastic flange

SOURCE: Prikladnaya mekhanika, v. 2, no. 8, 1966, 112-119

TOPIC TAGS: hole weakened plate, reinforced hole edge, stress concentration, flat plate model

ABSTRACT: The effect of the reinforcement of a circular hole in a plate on the magnitude of stresses in it is studied in the following cases: 1) the hole is reinforced by identical isotropic circular flanges (Fig. 1), and 2) the reinforcing thin ring inside the hole consists of n soldered isotropic component rings of constant cross section (Fig. 2). The material of the reinforcement is different from that of the plate. In both cases, the elastic equilibrium of the plate is analyzed under the assumptions that the reinforcement and the edge of the hole are free from external loading, and that the homogeneous fields of tensile and shear stresses in the plate at infinity are given. In case (1), expressions are derived in the form of series for determining the

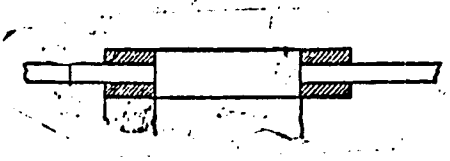


Fig. 1.

Card 1/2

L 44080-66

ACC NR: AP6030747

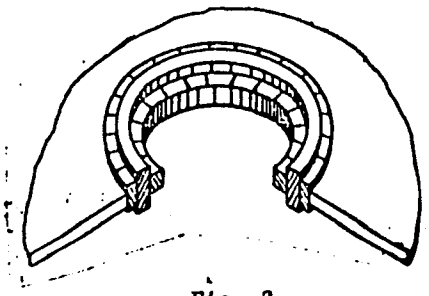


Fig. 2.

internal forces and moments, and the results of numerous computer calculations of stresses in the plate for various parameters of plates and flanges are given in a table. A comparison with stresses in a plate reinforced by a flange on one side shows that the stresses are 20 to 25% lower in the case of two side flanges (of the same weight as the one-side flange). In case (2), analogous calculations were carried out, and the effects of a two-component ring and of a single ring on the stresses in the plate are compared in a table, showing lower stress values in a plate with a two-component ring. Orig. art. has: 3 figures, 23 formulas, and two tables. [VK]

SUB CODE: 20/ SUBM DATE: 28Feb66/ ORIG REF: 008/ ATD PRESS: 5077

Card 2/2

FROLOV, V.S., dorozhnyy master (stantsiya Kotlyarevskaya, Severo-Kavkazskoy dorogi)

Work should be devided between the section and the district crews. Put' i put.khoz. 4 no.4:36 Ap '60. (MIRA 13:7)
(Railroads--Maintenance and repair)

14(9)

AUTHORS: Frolov, V. S., Anikina, T. N. SOV/64-59-3-21/24

TITLE: Protection of the Respiratory Organs by Means of Tube Gas-masks (Zashchita organov dykhaniya s pomoshch'yu shlangovykh protivogazov)

PERIODICAL: Khimicheskaya promyshlennost', 1959, Nr 3, pp 86-87 (USSR)

ABSTRACT: Tube gas-masks can be divided into three main types - with an air supply worked by the respiration itself (PSh-1), with a mechanically or electrically worked air supply (PSh-2) and the conduction gas-masks, supplied with compressed air by a compressor or bomb. In the present paper the types PSh-1 and PSh-2 are described and explained. The gas-mask PSh-1 (Fig 1) has a rubber and fabric tube with a length of 10 m and an inner diameter of 25 mm, at one end of which there is the mask and at the other end an air filter. The face mask is that of the type ShMP, connected with a flexible tube. The gas-mask PSh-2 (Fig 2) can be used by two persons at once, the appliance has two face masks ShMP with two tubes 20 m long and two electric motors for the air blower. The air blower can also be worked by hand in cases where there is no electric current. If the fan is damaged, the air supply is worked by the respiration until the danger zone is left. The two types of gas-masks are provided for industrial use.

~~Card 1/2~~

FROLOV, Vladimir Sergeyevich; MEDVEDEV, I.M., gvardii-podpolkovnik, red.; SRIBNIS, N.V., tekhn. red.

[Inertial navigation systems] Inertsial'nye sistemy navigatsii. Moskva, Voenizdat, 1963. 125 p. (MIRA 16:7)
(Inertial navigation (Aeronautics))

L 5252-66 EWT(d)/FSS-2/EEC(k)-2/EWA(c) BC

ACC NR: AP5023126 SOURCE CODE: UR/0103/65/026/009/1651/1654

AUTHOR: Frolov, V. S. (Moscow)

ORG: none

TITLE: Special errors of a gyro stabilizer consisting of float-type gyroscopes

SOURCE: Avtomatika i telemekhanika, v. 26, no. 9, 1965, 1651-1654

TOPICTAGS: gyro, gyrostabilized platform

ABSTRACT: The statistical characteristics of the angular velocity of drift in a float-type gyrostabilized platform are analyzed. These findings are offered: (1) External thermal influence (incompletely compensated by automatic thermo-features) and gradual liquation of the fluid are principal sources of the fortuitious drift of a gyro platform; (2) The statistical structure of the error of a float-type gyro unit is dominated by a near-zero-frequency component; hence, the autocorrelation function of the drift angular velocity can be reduced to this form: $R_{\omega\omega}(\tau) = \sigma_\omega^2 e^{-\alpha|\tau|}$; (3) With T 1, the drift-angle dispersion increases in proportion to the square of time; with $\alpha T \ll 1$ and increasing free-drift time, the dispersion increases linearly; here, T is the free-drift time and $1/\alpha$ is the

Card 1/2 UDC: 62-752.4

0901 1149

L 5252-66
ACC NR: AP5023126

correlation time. Orig. art. has: 3 figures and 17 formulas.

SUB CODE: NG/ SUBM DATE: 12Mar64/ ORIG REF: 002/ OTH REF: 004

Card 2/2

3

AUTHOR: Frolov, V. T. SOV/20-122-6-39/49

TITLE: Facies Conditions of Carbonate Concretion Formation in the Middle Jurassic and the Upper Part of the Lower Jurassic Deposits of Daghestan (Fatsial'nyye usloviya obrazovaniya karbonatnykh konkretsiy sredneyurskikh i verkhney chasti nizhneyurskikh otlozheniy Dagestana)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol 122, Nr 6, pp 1094-1097 (USSR)

ABSTRACT: Carbonate concretions form a prominent part of the deposits mentioned in the title. Three types of concretions are recognized: a.) calcite, b.) ankerite-dolomite, and c.) siderite concretions. Rules governing the occurrence of these concretion types can be established, according to the stratigraphic subdivision and the facies in which they occur. Nearly all of the deposits studied are marine, although various facies types are represented, from transitional continental deposits (in part also continental) to deeper water sediments deposited some distance from the coast. The suites are described in detail: a.) Karakhskaya, deposits formed in very shallow water. This suite is rhythmically bedded, consists largely of swamp

Card 1/4

deposits, and has a total thickness of 3-3.5 km. These coal containing beds grade southward into normal marine clays, which have been called the Samurskaya facies. The Samurskaya facies has a thickness of 2-2.5 km and is somewhat similar in lithology and facies to the Iri suite (1.5-2 km thick) and the Khivskaya suite (600-700 m thick). The latter suites, together with the Samurskaya facies of the Karakhskaya suite, contain a relatively rich marine fauna of ammonites, belemnites, brachiopods, bivalves, gastropods, etc. . These formations are relatively near-shore and gulf-type deposits. The higher lying Bathonian and Bajocian clays (total thickness of 2.5-3 km) are distinguished by a higher lime content, by the occurrence of limestone strata, and by a lesser organic content. The carbonate concretions occur in all stratigraphic subdivisions and in all types of rocks except the coarsest sandstones and conglomerates. Each type of concretion is represented by sandy and clayey varieties and by various morphological forms. Most of the concretions appear to be early diagenetic. The transitional sedimentary beds contain a clear ankerite-dolomite-

siderite assemblage and are characterized by a high concretion content (5-6 %). The concretion content of the coal bearing beds increases toward the top of the deposits and reaches 7-9 % in the middle part. From the continental to deeper water seposits, the form and intensity of the concretions vary. The siderite concretions are clearly concentrated in the coal bearing beds. The distribution of the maxima of siderite accumulation has a marked relation to the coal bearing mass. The latter is surrounded (in the direction from the sea) by these maxima. A second maximum of siderite concretions may be said to exist in the lagoonal-swampy zone. There are 1 figure and 3 Soviet references.

Facies Conditions of Carbonate Concretion Formation in the Middle Jurassic and the Upper Part of the Lower Jurassic Deposits of Daghestan

SOV/20-122-6-39/49

PRESENTED: June 3, 1958, by N. M. Strakhov, Academician
SUBMITTED: May 8, 1958

Card 4/4

FROLOV, V. T. Cand Geol-Min Sci -- (diss) "Jurassic carboniferous deposits of Dagestan." Mos, 1959. 18 pp (Mos Order of Lenin and Order of Labor Red Banner State Univ im M. V. Lomonosov. Geol Faculty. Chair of Historical and Regional Geology), 110 copies (KL, 41-59, 103)

FROLOV, V.T.

Jurassic faulting in Dagestan and its importance for the correct interpretation of the stratigraphy of Jurassic sediments. Nauch. dokl.vys.shkoly; geol.-geog.nauki no.1:74-80 '59. (MIRA 12:6)

1. Moskovskiy universitet, geologicheskiy fakul'tet, kafedra istoricheskoy i regional'noy geologii.
(Dagestan--Geology)

FROLOV, V.T.

Stratigraphic position and age of coal-bearing sediments in Daghestan. Sov.geol. 2 no.9:32-42 S '59. (MIRA 13:2)

1. Moskovskiy gosudarstvennyy universitet im. M.V.Lomonosova (MGU).
(Daghestan--Coal geology)

IZOKOV, [illegible]; [illegible], V.P.; KOCHARYANTS, S.B.; FROLOV, V.T.

[illegible] problems in the stratigraphy of Paleogene sediments in the [illegible]thern Yergeni Hills. Trudy NIIneftegaza no.13:47-53 '65.
(MIRA 18:9)

FROLOV, Vladimir Tikhonovich; POZDNYAK, I.I., red.

[Practice and methods of complex stratolithologic and paleographic studies; as revealed by a study made of the sediments of Daghestan] Opyt i metodika kompleksnykh stratigrafo-litologicheskikh i paleogeograficheskikh issledovanii; na primere iurskikh otlozhenii Dagestana. Moskva, Mosk. univ., 1965. 179 p. (MIRA 18:12)

ACC NR: AR6028422 SOURCE CODE: UR/0196/66/000/005/I034/I034

AUTHOR: Bamdas, A. M.; Shapiro, S. V.; Yemel'yanov, V. P.; Yevstigneyeva, T. A.; Blinov, I. V.; Davydova, L. N.; Zakharov, N. V.; Makhin, Yu. I.; Roginskaya, L. Z.; Frolov, V. T.

TITLE: Development work on static frequency changers in the Gor'kiy Polytechnic Institue im. A. A. Zhdanov

SOURCE: Ref. zh. Elektrotekhnika i energetika, Abs. 5I205

REF SOURCE: Sb. Vses. nauchno-tekhn. konferentsiya po primeneniyu vysokoskorostn. mashin s elektroprivodom povyshen. chastoty toka v nar. kh-ve. Ordzhonikidze, 1945, 47-51

TOPIC TAGS: frequency changer, frequency convertor, frequency conversion

ABSTRACT: The Laboratory has developed static ferromagnetic quadruplers, octuplers, and nonuplers with self-magnetization by flux intermediate harmonics, with single- and 3-phase output; also, a 1.5-ratio frequency changer has been developed. Their principal characteristics, power and weight data are reported. Specifically, the weight of active material varies from 36 to 29 kg/kva for capacities 1--6 kva; efficiency, 70--80%. With an input voltage variation of 90-110%, the quadrupler voltage varies only by ± 5--8%. The output voltage of a negative-feedback-type octupler varies only by ± 2% with a load current varying from zero to 130% its

Card 1/2 UDC: 621.314.26

ACC NR: AR6028422

nominal value. The octupler output voltage can be regulated within ± 15% by controlling its magnetization current. The efficiency of the 1.5-ratio frequency changer is 60--70%. It is capable of stable operation despite input voltage and load variations within ± 50% of their nominal values. Four figures. Bibliography of 4 titles. S. Shapiro [Translation of abstract]

SUB CODE: 09

Card 2/2

FROLOV V.S.

BERG, A.I., glav. red.; TRAPEZNIKOV, V.A., glav. red.; BENKOVICH, D.M., zaml glav. red.; LERNER, A.Ya., doktor tekhn. nauk, prof., zam. glav. red.; AVEN, O.I., red.; AGEYKIN, D.I., red.; kand. tekhn. nauk, dots., red.; AYZERMAN, M.A., red.; VENIKOV, V.A., doktor tekhn. nauk, prof., red.; VORONOV, A.A., doktor tekhn. nauk, prof., red.; GAVRILOV, M.A., doktor tekhn. nauk, prof., red.; ZERNOV, D.V., red.; IL'IN, V.A., doktor tekhn. nauk, prof., red.; KITOV, A.I., kand. tekhn. nauk, red.; KOGAN, B.YA., doktor tekhn. nauk, red.; KOSTOUSOV, A.I., red.; KRINITSKIY, N.A., kand. fiz.-mat. nauk red.; LEVIN, G.A., prof. red.; LOZINSKIY, M.G., doktor tekhn. nauk, red.; [illegible]OSHIYEVSKIY, V.I., red.; MAKSAREV, Yu.Ye., red.; MASLOV, A.A., dots., red.; POPKOV, A.A., red.; RAKOVSKIY, M.Ye., red.; ROZENBERG, L.D., doktor tekhn. nauk, prof., red.; SOTSKOV, B.S., red.; TIMOFEYEV, P.V., red.; USHAKOV, V.B., doktor tekhn. nauk, red.; FEL'DBAUM, A.A., doktor tekhn. nauk, prof., red.; FROLOV, V.S., red.; KHARKEVICH, A.A., red.; KHRAMOY, A.V., kand. tekhn. nauk, red.; TSYPKIN, Ya.Z., doktor tekhn. nauk, prof., red.; CHELYUSTKIN, A.B., kand. tekhn. nauk, red.; SHREYDER, Yu.A., kand. fiz.-mat. nauk, dots., red.; BOCHAROVA, M.D., kand. tekhn. nauk, starshiy nauchnyy red.; DELONE, N.N., inzh., nauchnyy red.; BARANOV, V.I., nauchnyy red.; PAVLOVA, T.I., tekhn. red.

(Continued on next card)

BERG, A.I.--- (continued). Card 2.

[Industrial electronics and automation of production processes]Avtomatizatsiia proizvodstva i promyshlennaia elektronika. Glav. red. A.I.Berg i V.A.Trapeznikov. Moskva, Gos.nauchn. izd-vo "Sovetskaia Entsiklopediia." Vol.1. A - I. 1962. 524 p. (MIRA 15:10)

1. Chlen-korrespondent Akademii nauk SSSR (for Sotskov, Kharkevich, Zernov, Timofeyev, Popkov).
(Automatic control) (Electronic control)

FROLOV, Vladimir Sergeyevich

Inertsial'nyye sistemy navigatsii. Moskva, Voyenizdat, 1963.

125 p. illus., diagrs. (Za voyenno-tekhnicheskiye znaniya)

Bibliography: p. 124-125.

1. Inertial navigation. 2. Russia - Inertial navigation.

FROLOV, V S

112-3-5964

Translation from: Referativnyy Zhurnal, Elektrotekhnika, 1957 Nr 3, p. 131 (USSR)

AUTHOR: Frolov, V. S.

TITLE: Interrupter for Cable Fault Detector (Preryvatel'k kabeleiskatelyu)

PERIODICAL: Sb.po obmenu opytom izobretat. i rats. raboty v obl. elektrifikats. zh. d. i energ. kh-va, 1955, Nr 1, pp. 17-18

ABSTRACT: The induction method of locating faults in a cable using a cable fault detector entails difficulties, such as poor audibility of the audio-frequency test signal and the presence of noise, which renders differentiation of the test signal difficult. It is proposed that an interrupter be connected in the generator output. The interrupter consists of a pulsing device ("pul's-troyka") housed in an attachment to the generator. The power for the interrupter is provided by the a-c source supplying the generator. In the attachment there are three telephone relays, a selenium rectifier and a step-down transformer rated at several watts. The interrupter

Card 1/2

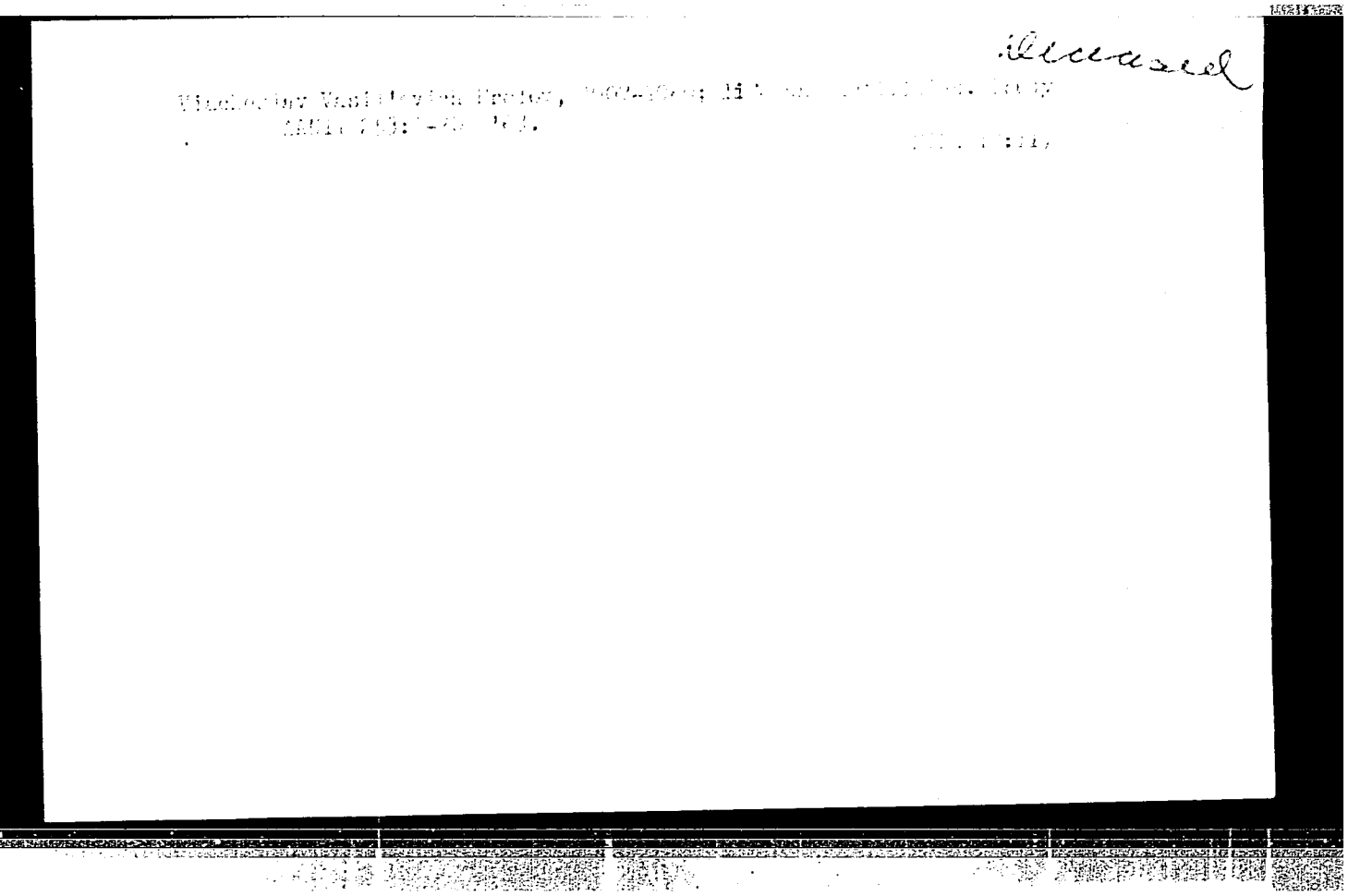
Interrupter for Cable Fault Detector (Cont.)

applies the audio-frequency signal in impulses, in order to differentiate the test signal from noise. The interrupter is part of an installation consisting of a gas-tube and kenotron rectifier unit and cable fault detector amplifiers located at the test station of the second section of the power system for the Moscoe-Kursk-Donbass railroad; the interrupter has been used successfully. I. V. I.

Card 2/2

PRUSAKOV, M.B., inzh.; KUSTOV, V.M., inzh.; BARANOV, L.A., inzh.; LUK'YANOV, S.I., inzh.; FROLOV, V.S., inzh., retsenzent; USENKO, L.A., tekhn. red.

[Operation and repair of the equipment of d.c. traction substations] [kspluatatsiia i remont oborudovaniia tiagovykh podstantsii postoiannogo toka. [By]M.B.Prusakov i dr. Moskva, Transzheldorizdat, 1963. 211 p. (MIRA 16:5)
(Electric railroads--Substations)



S/054/60/000/02/06/021
B022/B007

AUTHOR: Frolov, V. V.

TITLE: A Spectrometer for the Nuclear Magnetic Resonance in Intermediate Fields

PERIODICAL: Vestnik Leningradskogo universiteta. Seriya fiziki i khimii, 1960, No. 2, pp. 49-54

TEXT: The present paper describes a device for the investigation of nuclear magnetic resonance (NMR) in liquids in magnetic fields of less than 150 oersteds. In the spectrometer described, the magnetic field is generated by means of a solenoid and two symmetrically arranged rings, through which a current passes; these rings serve the purpose of compensating the inhomogeneity of the field near the center of the system. The total view of the magnetic system (Fig. 1) and the schematical drawing of the magnetic system (Fig. 2) are shown. Fig. 3 shows a block diagram of the radiotechnical part of the device, and Fig. 4 gives the dispersion of the NMR-signals in 3 cm^3 of water. In this part of the device the tubes 6Ж8 (6Zh8) and 6Н3П (6N3P), an oscilloscope with d.c.

V/B

Card 1/2

A Spectrometer for the Nuclear Magnetic Resonance in Intermediate Fields

S/054/60/000/02/06/021
B022/B007

amplifier of the type ЭН 0-1 (ENO-1), or a self-recording device of the type ЭППП-09 (EPP-09) is used. One of the main tasks to be performed is measurement of the width of lines and intervals between the fine-structure components of the NMR-signals at frequencies of from 20 to 600 kc/s and a resolution of about 2.10^4. The width of the lines in the apparatus is about 7 c in a field of 35 oersteds. The author thanks Docent F. I. Skripov for supervising the investigation and evaluating the article; he also thanks Mechanician M. M. Bryantsev, who carried out part of the radiotechnical assembly-work. There are 4 figures and 17 references.

√B

Card 2/2

S/054/63/004/001/008/022
B102/B186

AUTHORS: Frolov, V. V., Kolikhova, I. A.

TITLE: Orthogonal compensators of the magnetic field inhomogeneities in a nuclear magnetic-resonance spectrometer

PERIODICAL: Leningrad. Universitet. Vestnik. Seriya fiziki i khimii, no. 1, 1963, 59-66

TEXT: After a detailed discussion of the theoretical bases of orthogonal current compensators for simulation of magnetic field spherical harmonics and a calculation of the characteristic parameters of such compensators some experimental results are dealt with. The application of current compensators makes it possible to improve resolution by one order of magnitude as compared with that achieved by coaxial compensating rings (V.V. Frolov, Vestnik LGU, no.10,49,1960). The absolute resolution attainable amounts to 0.3-0.5 cps in a field of about 17 gauss and a volume of 15 cm^3. There are 2 figures and 1 table.

SUBMITTED: July 24, 1962

Card 1/1

KALLISTOV, P.L.; ZENKOV, D.A.; PROKOF'YEV, A.P. Prinimali uchastiye: BOGDANOV, F.M.; BORZUNOV, V.M.; BURYBLIN, A.V.; DROZDOV, M.D.; YEROFEYEV, B.N.; KOMISSAROV, A.K.; KOGAN, I.D.; LYUBIMOV, I.A.; MIRLIN, R.Ye.; ROKHLIN, M.I.; SERGEYEV, P.V.; SEMENOV, A.D.; FROLOV, V.V.; NEMANOVA, G.F., red. izd-va; GORDIYENKO, Ye.B., tekhn. red.

[Instructions for applying the classification of reserves to primary gold deposits] Instruktsiia po primeneniiu klassifikatsii zapasov k korennym mestorozhdeniiam zolota. Moskva, Gos. nauchno-tekhn.izd-vo lit-ry po geol. i okhrane nedr, 1955. 46 p. (MIRA 15:2)

1. Russia (1923- U.S.S.R.) Gosudarstvennaya komissiya po zapasam poleznykh iskopayemykh.
(Gold ores--Classification)

GOL'TSMAN, M.I.; FROLOV, V.V.

Temperature measurement errors of radiosondes. Probl.Arkt.i Antarkt. no.3:53-63 60. (MIRA 13:9)
(Atmospheric temperature)
(Radiosondes)

FROLOV, V.V. glavnyy mekhanik (st. Verkhovtsevo Stalinskoy dorogi).

Using cranes for laying switch boxes. Put' i put. khoz. no.2:31 F '59. (MIRA 12:3)
(Cranes, derricks, etc.) (Railroads--Switches)

FROLOV, V.V.

Redesigning the lead-in pole instrument. Avtom.telem.i sviaz' 3 no.10:26-27 O '59. (MIRA 13:2)

1. Starshiy elektromekhanik Uzlovskoy distantsii signalizatsii i svyazi Moskovskoy dorogi.
(Electric lines--Testing)

KUPERMAN, P.I.; GRYAZNOV, N.S.; MOCHALOV, V.V.; FROLOV, V.V.; MUSTAFIN, F.A.; PUSHKASH, I.I.; SLAVGORODSKIY, M.V.; LAZAREV, B.L.; BORISOV, V.I.; Prinimali uchastiye: CHERKASOV, N.Kh.; ZABRODSKIY, M.P.; RYTCHENKO, A.I.; RUTKOVSKAYA, Ye.N.; SAITBURGANOVA, N.I.; SHTAGER, A.A.; SHISHLOVA, T.I.; BUDOL', Z.P.; MEN'SHIKOVA, R.I.; GORELOV, L.A.; AGARKOVA, M.M.; KOUROV, V.Ya.; KOGAN, L.A.; BEZDVERNYY, G.N.; POKROVSKIY, B.I.

Effect of the lengthening of the coking time on the coke quality and testing of coke in the blast furnace process. Koks i khim. no.9: 23-28 '63. (MIRA 16:9)

1. Vostochnyy uglekhimicheskiy institut (for Kuperman, Gryaznov, Mochalov, Kogan, Bezdvernyy, Pokrovskiy). 2. Ural'skiy institut chernykh metallov (for Frolov). 3. Nizhne-Tagil'skiy metallurgicheskiy kombinat (for Mustafin, Pushkash, Slavgorodskiy, Lazarev, Cherkasov, Zabrodskiy, Rytchenko, Rutkovskaya, Saitburganova, Shtager, Shishlova, Budol', Men'shikova). 4. Koksokhimstantsiya (for Borisov, Gorelov, Agarkova, Kourov).

(Coke—Testing)

FROLOV, V.V., dotsent, kandidat tekhnicheskikh nauk.

Phenomena of the spreading of molten metals on metallic surfaces.
[Trudy] MVTU no.24:48-61 '53. (MLRA 7:10)
(Solder and soldering) (Metals)

FROLOV, V.V.; SHORSHOROV, M.Kh., kandidat tekhnicheskikh nauk, redaktor; MATVEYEVA, Ye.N., tekhnicheskiy redaktor.

[Physical and chemical processes of arc welding] Fiziko-khimicheskie protsessy v svarochnoi duge. Moskva, Gos.nauchno-tekhn.izd-vo mashinostroit.lit-ry, 1954. 129 p. (MLRA 8:5)
(Electric welding)

FROLOV, V.V., kandidat tekhnicheskikh nauk.

Calculating the effective potential of ionization in welding under flux. [Trudy] MVTU no.37:220-226 '55. (MIRA 9:6)
(Ionization of gases) (Electric welding)

LEPETSKIY, I.A. [deceased]; FROLOV, V.V., kandidat tekhnicheskikh nauk, redaktor; PASTERNAK, N.I., redaktor izdatel'stva; SHMEL'KINA, S.I., tekhnicheskiy redaktor; TIKHONOV, A.Ya., tekhnicheskiy redaktor

[Modification of metals during welding] Izmenenie metallov pri svarke. Pod red. V.V.Frolova. Moskva, Gos. nauchno-tekhn. izd-vo mashinostroit. lit-ry, 1956. 116 p. (MLRA 9:7)
(Welding)

FKolov, V.V.

137-58-1-864

Translation from: Referativnyy zhurnal, Metallurgiya, Nr 1, p 124 (USSR)

AUTHORS: Arutyunova, I.A., Frolov, V.V.

TITLE: Automatic Ceramic-flux Submerged-arc Consumable-electrode Welding of Copper Alloys (Avtomaticheskaya svarka mednykh splavov plavyashchimsya elektrodom pod sloyem keramicheskogo flyusa)

PERIODICAL: V sb.: Prochnost' i avtomatizatsiya svarki (MVTU, 71). Moscow, Mashgiz, 1957, pp 105-115

ABSTRACT: An investigation has been made of automatic welding of chromium bronze Br. Kh-1 with a standard Cu wire tip, grade M-1, submerged beneath ceramic flux. The possibility of alloying the weld metal with Cr, Mn, Mo, Ti, Zr, Be, and other elements by introducing a precipitating deoxidizer (Al) into the flux, as well as alloying components in the form of powders of pure metals or Cu alloys, was checked. The slag-forming portion of the flux consists of the following exceedingly simple components (in percent). Al_2O_3 16.00, B_2O_3 14.25, SiO_2 23.10, CaO 8.90, MgO 7.65, CaF_2 21.00, Na_2O 9.10. It was found that the weld metal is capable of being alloyed by

Card 1/2

Automatic Ceramic-flux (cont.)

these elements within a broad range, and Ti, Zr, and Be induce a transformation in the weld metal and the Al. Automatic submerged welding of Br.Kh-1 bronze yields tight seams without pores or cracks, having the same strength as the parent metal. The procedure for welding Br. Kh-1 bronze 5.5 mm in thickness is: 450-500 amp current, 38-40 v arc potential, 21-22 m/hr welding speed, graphite backing having shaping grooves. The resistance to formation of hot cracks is several times greater in submerged-arc welding than it is when fused fluxes AN-20 and OSTs-45 are employed.

G.N.

1. Copper alloys--Welding 2. Submerged melt welding--Automation

Card 2/2

FROLOV, V. V. (Cand. Tech. Sci.) (Docent)

"Characteristics of Metallurgical Processes in Submerged Arc Welding of Copper and Its Alloys Using Ceramic Fluxes," p. 172 in book Reports of the Interuniversity Conference on Welding, 1956. Moscow, Mashgiz, 1958, 266pp.

S/137/61/000/001/021/043
A006/A001

Translation from: Referativnyy zhurnal, Metallurgiya, 1961, No. 1, p. 9, # 1E70

AUTHOR: Frolov, V.V.

TITLE: Automatic Welding of Copper Alloys With Consumable Electrode Under a Layer of Ceramic Flux

PERIODICAL: "Tr. Nauchno-tekhn. o-va sudostroit. prom-sti", 1959, No. 33, pp. 103 - 113

TEXT: The author analyzes welding of Cu and its alloys under ceramic flux developed at MVTU imeni Bauman by V.V. Frolov and I.A. Arutyunova. Thermodynamical calculations are given for the selection of the deoxidizer type and the Al amount in the flux.

I. A.

Translator's note: This is the full translation of the original Russian abstract.

Card 1/1

S/135/60/000/008/009/010
A006/A002

AUTHOR: Popekhin, M.M., Engineer

TITLE: The Moscow Regional Conference of Welding Engineers

PERIODICAL: Svarochnoye proizvodstvo, 1960, No. 8, pp. 40-41

TEXT: The Fifth Annual Regional Conference on the results of scientific and industrial work achieved in the field of welding during 1959, was held in Moscow from March 22-24, 1960. The Conference was attended by over 600 representatives of various organizations from Moscow, the Moskovskaya Oblast', Leningrad, Bryansk, Vladivostok, Dnepropetrovsk, Kramatorsk Ufa, Voronezh and other towns. The Conference was opened by N.N. Rykalin, Corresponding Member of the AS USSR, Head of the Welding Department at MONITOMASh. The Conference heard the following reports: Engineer Ye.V. Deyev, representatives of Gosplan RSFSR, on the supply of welding equipment and materials in 1960 and the following years; Ye.M. [illegible], Engineer, VNIIST, on "New Electrodes With Plastic Moisture Resistant Coating for Welding Low-Carbon and Low-Alloy Steels"; A.I. [illegible], Candidate of Technical Sciences, VNIIST, on "Investigation of the Metal Transition in the Welding Arc During Manual Arc Welding"; V.A. Vinokurov, Candidate of Technical Sciences, and A.S. Gazaryan, Engineer, MVTU, on the deformation in electroslag welding and regularities in transverse deformations arising during the welding and cooling process; Ye.M. Kuznak, Doctor of Technical Sciences, and F.L. Yefremova, Engineer, Moskovskiy institut [illegible] (Moscow Institute of Petroleum Chemistry and the Gas Industry), on "Characteristics of Wear Resistance of Reinforcements with Grained Hard Alloy"; [illegible], Engineer, NIITMASh, on "The Use of Ceramic Fluxes With Special Admixtures in Automatic Building-up"; V.B. Shlyapin, Candidate of Technical Sciences, TsNII MPS, on "Vibro-Arc Building-Up Under Flux"; [illegible] and [illegible] Archin, Engineers, [illegible] Plant, on cold welding of cast iron; Yu.N. [illegible], Engineer (Voronezh), on using manual and automatic electroslag welding process for welding-up large defects in grey-iron castings of 30 mm wall thickness and more; A.I. [illegible], Candidate of Technical Sciences, VIAM, on results obtained in shielding spot and roller welding of aluminum alloys; N.A. [illegible], Engineer, ZIL, on comprehensive mechanization and automation of resistance welding in automobile building; P.P. Volodin, Engineer, on roller welding of aluminum alloys; M.I. [illegible], Engineer, NIAT, on "New Welding Equipment"; [illegible], Candidate of Technical Sciences, MVTU, on "Some Results in the Development of Equipment for Condenser Seam Welding"; G.M. Kasparzhak, Candidate of Technical Sciences, and V.B. Sidorov, Candidate of Technical Sciences, TsNIIelektron, on "Basic Features of Multi-Purpose "[illegible]" (VSK) Welding Straighteners"; V.A. Petrov, Engineer, on "Checking Equipment for Controlling the Resistance Welding Process"; N.N. [illegible], Candidate of Technical Sciences, [illegible], Candidate of Technical Sciences, and V.D. [illegible], Engineer, [illegible], on "A New Hydraulic Machine in Friction Welding"; A.S. [illegible], Candidate of Technical Sciences, MVTU, on a method of calculating the system and rate of welding pool crystallization; A.A. Yerokhin, Candidate of Technical Sciences, G.P. Balandin, Candidate of Technical Sciences and V.D. Kodolov, Engineer, IMET, on the mechanism of the ultrasonic effect on crystallizing metals; [illegible] Gerasimenko, Candidate of Technical Sciences, VIAM, and L.S. Livshits, Candidate of Technical Sciences, VNIIT, on diffusion processes, such as carbon migration in the weld metal; [illegible], MVTU, on "[illegible] Processes in Welding"; M.Kh. Shorshorov, Candidate of Technical Sciences and Yu.I. Sokolov, Engineer, IMET, on "Metallurgical Means of Preventing Hot Cracks in Welding Heat-Resistant Austenite Steels and Nickel Alloys"; O.V. [illegible], Candidate of Technical Sciences, and G.M. Yakushin, Engineer, MVTU, on "Comparison of Methods of Evaluating the Proneness to Hot Cracks in Welding Industrial Aluminum Alloys"; V.S. [illegible], Engineer (MVTU) on "The Resistance of the Weld Metal to Hot Crack Formation and Methods of Determining Same"; M.M. Kraychik, Candidate of Technical Sciences, TsNII MPS, on the necessity of determining the proneness to brittleness of steel by its reaction to burns; G.A. Asinovskaya, Engineer, on "Automation of Gas-Flux Soldering, Welding and Building-up Processes", containing information on a new method of building-up brass; S.G. [illegible], VNIIAvtogen, on "Optimum Conditions of Oxygen Cutting"; I.D. Kulagin, Candidate of Technical Sciences, A.V. Nikolayev, and V.A. Petrunichev, Engineers, (IMET) on the investigation into the power characteristics of the arc of a plasma head and the technological properties of a plasma jet; V.P. Norenko, Engineer, VNIIPTMASh, on cutting "1Kh18N9T" (1Kh18N9T) stainless steel with an arc plasma jet; a number of reports on various types of welding technology; N.N. Rykalin, Corresponding Member of the AS USSR, on welding practise in France; M.M. Popekhin, Engineer, Scientific Secretary of the Welding Department at MONITOMASh, on the state of realizing the resolutions of the preceding Conference. The Conference decided to request the State Committee of

S/135/60/000/009/001/015
A006/A002

AUTHOR: Frolov, V. V., Candidate of Technical Sciences

TITLE: Thermodiffusion Processes in the Base Metal During Welding

PERIODICAL: Svarochnoye proizvodstvo, 1960, No. 9, pp. 1-5

TEXT: The author studies the effect of diffusion and gas (hydrogen) saturation of base metal in the welding zone on the properties of the weld joint. Diffusion flows arise as a result of changes in the solubility of the gas in the base metal that is subjected to the effect of a moving thermal field during welding process. When heating the metal, containing a dissolved gas, the arising thermodiffusion processes are directed from the heated to the unheated metal and result in the accumulation of gas in the weld zone. The gas permeability, caused by thermodiffusion, depends on the content and solubility of the gas in the metal, the diffusion coefficient, the thermophysical properties of the metal (heat conductivity, density, heat capacity, melting temperature) and the welding conditions determining the temperature field. The coefficients of permeability and the character of diffusion flows in welding were investigated for the case of heating semi-unbounded Fe, Ni, Cu and Al bodies with an

Card 1/3

Thermodiffusion Processes in the Base Metal During Welding

electric arc. Data to calculate the diffusion coefficients for Al, Cu, Ni and Fe given by Smitells, Rensley and Heller are presented in Table 1. Calculated values of diffusion coefficients depending on temperature are contained in Table 2 and Figure 3. Welding was performed with 450 amps, 20 - 30 volts and 21 m/hr welding speed. The distribution of temperature in one plane of the semi-unbounded body was determined using N. N. Rykalin's formula:

$$T_{(x,R)} = \frac{q_n}{2\pi\lambda R} \exp\left[-\lambda \frac{v}{2a}(x + R)\right]$$

where x is the distance from the beginning of the movable system of coordinates and R is the radius-vector ($R = \sqrt{x^2 + y^2}$; $R = \sqrt{x^2 + z^2}$). The calculation is made for a place where R = z = y. Data obtained were used to plot the temperature fields in the given section and to find the coefficient of permeability for Fe, Ni, Cu and Al. The diffusion process is calculated by establishing the hydrogen volume in the metal heated to 500°C; the time of the liquid state of the pool; and the hydrogen volume which can pass through the heated metal during the liquid state of the pool. Data obtained show that hydrogen included in the heated metal, can diffuse and evade through the liquid pool only in the

Card 2/3

Thermodiffusion Processes in the Base Metal During Welding

case of Fe. In the other metals, the hydrogen accumulates near the fusion zone and may cause defects in the weld joint during cooling, since the isosteric pressure increases with lower temperature, particularly in metals in which hydrogen is diffused only to a lower degree (Al, Cu). For Fe and Ni the strength increases with lower temperatures and the strength characteristics exclude the formation of pores in the fusion zone. Thus it appears that thermodiffusion processes may cause defects of the weld depending on its strength and ductility at temperatures approaching the melting point. The formation of porosity is most probable in ductile metals. Thermodiffusion processes in the weld metal require the inspection of the base metal in respect to its hydrogen content, for the production of important weld joints, particularly in non-ferrous metals. There are 4 tables, 6 figures and 8 references: 6 Soviet and 2 English.

ASSOCIATION: MVTU imeni Bauman

Card 3/3

FROLOV, V.V.; LAZAREV, B.L.; GAVRILYUK, L.Ya.; FOFANOV, A.A.

Operation of blast furnaces with fluxed sinter made of Tagil-Kushva region ores. Stal' 21 no. 4:296-299 Ap '61. (MIRA 14:4)

1. Nizhne-Tagil'skiy metallurgicheskiy kombinat i Ural'skiy institut chernykh metallov.
(Ural Mountains—Iron ores) (Blast furnaces)

27809

1.2300 (1573)

S/549/61/000/101/007/015
D256/D304

AUTHOR: Frolov, V.V., Candidate of Technical Sciences, Docent

TITLE: Thermo-diffusion processes and porosity formation in welded joints of light and non-ferrous metals

PERIODICAL: Vysshaye tekhnicheskoye uchilishche. Trudy. Svarka tsvetnykh splavov, redkikh metallov i plastmass, no. 101, 1961, 132 - 174

TEXT: The importance of obtaining high-quality welded fabrications in non-ferrous metals stimulated the author to investigate the thermodiffusion phenomena of gas dissolved in the parent metal under the heating conditions of an electric arc. Hydrogen is the gas especially considered. After briefly mentioning the two other sources of porosity formation-gas-producing reactions and high vapor density of one or more of the alloying elements - the author considers in more detail the third possible source - diffusion of gas present in the parent metal. Porosity can occur even in well deoxidized metal by reason of changing conditions of gas solubility

Card 1/12

(normally of hydrogen) in the parent metal with changes in temperature. Whatever the welding process, hydrogen in the parent metal can cause porosity on account of the high gradients of the temperature field during welding, and this in turn can contribute towards the occurrence of hot cracking, although this would depend on the strength characteristics of the solidifying metal. It seems probable that the pressure of the gas being liberated could cause porosity in a temperature range of high plasticity and cracking in a brittle temperature range. Although metal being welded normally contains only a small quantity of hydrogen, due to the high mobility of the latter its local concentration in the welding zone can change considerably during heating and cooling. The author then examines a) solubility of hydrogen in metals: By Sievert's law, in absence of hydride formation

$$[H] = K p_{H_2}^{0,5}, \qquad (1)$$

$$K = K_0 e^{-\frac{Q}{2RT}} \qquad (2)$$

Card 2/12

where p_{H_2} - pressure of molecular hydrogen beneath the metal surface; k - solubility coefficient depending on temperature; Q - heat of solution of hydrogen in metal ($Q < 0$ in the absence of chemical reactions with the metal). Abrupt solubility changes in three metals were shown graphically. Assuming a constant gas content in a metal, then the equilibrium pressure required to keep it in solution varies with temperature. b) Diffusion of hydrogen in metal: Normal diffusion is considered with the aid of Fick's law.

$$dm = - D_0 \frac{dc}{dx} S \, d\tau, \qquad (3)$$

where m - mass of transferring hydrogen; D_0 - diffusion coefficient strongly temperature-dependent;

$$D_0 = Ke^{- \frac{Q}{2RT}};$$

$- \frac{dc}{dx}$ - concentration gradient; S - area through which diffusion

Card 3/12

occurred; τ - time. In the present case, Fick's law is inapplicable since the gas concentrations through the whole volume of heated metal are taken to be the same, and the diffusion processes arise through temperature changes in the different regions. This non-uniformity of heating associated with any fusion welding process must give rise to a diffusion of gas from a cold region, saturated with gas, to a heated, unsaturated region. Thus if the parent metal contains hydrogen this will diffuse into the weld pool metal from the metal surrounding it; the latter will have the greatest gas solubility and thus the least isosteric pressure, and will thus function as a vacuum in relation to the surrounding solid metal. The Richardson formula can be used for calculating the permeability of the metal (for hydrogen):

$$D = K \frac{1}{d} p^{1/2} T^{1/2} e^{-\frac{Q}{2RT}} \qquad (4)$$

where D - speed of penetration of gases, normally in cm^3 H_2 passing in 1 sec. across a 1 mm thick layer 1 cm^2 in area with pressure

Card 4/12

Thermo-diffusion processes and . . .

drop of $p^{1/2}$ mm Hg; $D_o = Ke^{-Q/2RT}$ - diffusion coefficient, $cm^2/sec.$; T - temperature; d - layer thickness; Q - heat of diffusion. However, it has been shown experimentally that $T^{1/2}$ in (4) be neglected and the equation written

$$D = K \frac{1}{d} p^{1/2} e^{-\frac{Q}{2RT}}. \qquad (5)$$

The layer thickness and isosteric pressure fall are functions of the welding thermal conditions. To determine the penetration coefficient according to the Richardson equation it is necessary to give the thermal conditions of welding, since d in Eq. (5) will be the distance between temperature field isotherms, and the isosteric pressures gradient will also be determined by the temperature distribution in the welded component. c) Temperature and isosteric pressure distribution in metal during welding: For a welding heat source moving at constant speed along a plate the temperature field neglecting that through the plate thickness, can be calculated by

Card 5/12

Thermo-diffusion pro:::sse{ and ...

the formula of N.N. Rykalin (Ref. 15: Raschety teplovykh protsessov pri svarke, Mas:giz, 1951).

$$T_{(x,\ r)} = \frac{q}{2\pi\lambda\cdot\delta}\, e^{-\frac{vx}{2a}} \cdot K_0\left(r\sqrt{\frac{v^2}{4a^2} + \frac{b}{a}}\right). \qquad (6)$$

To compare the th:e metals under identical welding conditions, these are taken a:: 450 A current, 28 arc volts, welding speed 21 m/hr = 0.583 :/sec., plate thickness δ = 0.6 cm. In submerged arc welding with : ceramic flux, assuming an arc efficiency of 0.6 the effective th::mal power is

$$q = 0.24 \times 0.6 \times 450 \times 28 = 1810 \text{ cal/sec}. \qquad (7)$$

Using the differ::t thermal data for iron, copper and aluminum the temperature fiel! for these conditions are computed and given in tabulated f:rm.) Calculation of penetration and diffusion coefficients in weldin:) Diffusion arising from the non-uniform heating in welding can b: :alculated from the Richardson formula (5), using the data obtaine:) The Richardson formula is put into the form

Card 6/12

Thermo-diffusion processes and . .

$$D = D_0 \frac{1}{\Delta y_0} (\sqrt{p_1} - \sqrt{p_2}) \ (cm^3 \ H_2/sec.cm^2). \qquad (8)$$

Where D_0 = diffusion coefficient, mean for temperature interval [redacted] Δy_0 - difference of "isobarotherm" ordinates; p_1 and p_2 - isoteric pressures corresponding to neighboring isotherms (mm Hg). Diffusion will be directed normally to the isotherm delineating the weld pool, but since the system of coordinates moves along the joint at the speed of the heat source, the dominant part is played by diffusion in the front part of the weld pool since here the gas comes from parts of the metal as yet [redacted] impoverished by diffusion. To compare the three metals, diffusion along the Y axis is alone considered and the results given in tabulated form. e) Effect of plate thickness on thermodiffusion phenomena: The temperature fields are calculated and constructed for aluminum of 6, 10, 15, 30 and 50 mm thickness at the same energy input and welding speed conditions. Isotherms for the a0y plane are shown. The 50 mm plate is shown to be virtually equivalent to a semi-infinite body. At

Card 7/12

30 mm the isotherms again form coaxial circles, but of a slightly smaller radius. The field form changes considerably in the lower thickness until at 6 mm it is considered that temperature is uniformly distributed through the section. Corresponding data for metal heated above 400°C are also given in tabulated from. f) Influence of welding conditions: These were investigated mathematically for copper 6 mm thick containing 1 cm^3 H_2/100 g. Welding current and speed were varied separately. a) Influence of effective thermal power of heat source q (four different values). The procedure is to calculate D mean for melting point 500°C isotherms in the z0y section from diffusion coefficient. The increase in D with decreasing q is explained by the increasing temperature and isosteric pressure gradients. However the decreasing volume of heated metal means that the hydrogen available for diffusion is reduced, and the smaller time of existence of the weld pool will reduce the diffusion time. The values of τ_{max} were determined from the 1083 isotherm, and together with the volumes of hydrogen available for diffusion, V_{H_2}, are shown in tabulated form. Also shown is the vo-

Card 8/12

Thermo-diffusion processes and ..

lume of hydrogen, V_{diff}, which could cross the strip of metal in τ_{max} ($= D_{mean} \times 0.6 \times \tau_{max}$). The data shows that porosity formation is possible in all cases, since the volume of dissolved hydrogen is considerably greater than the volume which can leave the metal, but with large q a larger part of the hydrogen can get out. The influence of q on the various quantities affecting diffusion is shown graphically. τ_{max} can be influenced by means other than arc parameters e.g. a slag layer v_s a gas shield, or by preheating. However, the latter would also increase the volume of heated metal. b) Influence of welding speed: Welding speed is varied between 12 and 21 m/hr at two different values of q. The general result expressed by V_{H_2}/V_{diff} remains practically constant, and indicates that in this range welding speed has little influence on diffusion phenomena. G) Influence of original gas content: The penetration coefficient D, will be almost directly proportional to the original uniform gas content, since the equation for D contains ter[illegible]

Card 9/12

in $\sqrt{\text{isosteric pressure}}$, while [H] is proportional to $\sqrt{\text{pressure}}$. V_{H_2} and V_{diff} are also directly proportional to the inital gas content, and their ratio remains approximately constant. These phenomena can be studied and demonstrated by running a tungsten arc on a metal specimen. It is concluded that 1) Factors affecting diffusion processes and pore formation. (a) As base metal hydrogen content [H] increases diffusion intensity increases, but isosteric pressure increases as $[H]^2$. 2) The greater the solubility of gas in metal the lower (at a given gas concentration) are the isosteric pressure, diffusion intensity, and possibility of pore or crack formation. 3) As diffusion coefficient increases, the diffusion process intensity decreases, but at certain values of the penetration coefficient the heated metal becomes permeable to hydrogen which can escape through the weld pool (for iron at a hydrogen content of 0.1 $cm^3/100$ g). 4) Physical properties determine the temperature field, giving rise to temperature and isosteric pressure gradients which are the driving force of diffusion. Most important are the thermal diffusivity a (cm^2/sec.) and the melting

point. The larger the former and smaller the latter, the greater the probability of pore or crack formation in welding. 5) Physical mechanical properties at elevated temperatures can govern whether pores or cracks were formed. 6) With increasing power of the welding heat source the conditions for gas liberation via the pool are improved, but the quantity of hydrogen available for diffusion is also greatly increased. Within the welding speed limits investigated this parameter appears to have little influence. The main factor influencing the prevention of porosity is the weld pool time of existence, τ_{max}. 7) Plate thickness had an influence on porosity formation, a maximum being found at a certain thickness. There are 21 figures, 21 tables and 17 references: 11 Soviet-bloc and 6 non-Soviet-bloc. The references to English-language publications read as follows: W.G. Hull, D.F. Adams, Gas Porosity and Sources of Hydrogen in the Metal-Arc-Welding of Light Alloys, British Welding Journal, 1958 (5), no. 10; N. Christensen, K. Gjermundsen, R. Rose, Hydrogen in Mild-Steel Weld Deposits, British Welding Journal, 1958 (5), no. 6; Three Ways To Weld Aluminum Without Porosi-

Card 11/12

Thermo-diffusion processes and ...

ty, Industrial and Welding, 1958 (31), no. 4; M.B. Kasen, A.R. Pfluger, Chlorine Addition for Hight Quality Inert - Gas Metal - Arc - Welding of Aluminum Alloys, Welding Journal, 1958 (37) no. 6.

Card 12/12/

ALEKSEYEV, S.A.; BALABIN, V.V.; BARBASHIN, N.N.; GORSHKOV, A.A.; ZHAROV N.T.; MARIYENBAKH, L.M.; RUBTSOV, N.N., doktor tekhn. nauk, prof.[deceased]; SERGEYEV, V.S.; SOSNENKO, M.N.; FROLOV, V.V.; KONSTANTINOV, L.S., kand. tekhn. nauk, red.; CHERNYAK, O.V., red. izd-va; UVAROVA, A.F., tekhn. red.; TIKHANOV, A.Ya., tekhn. red.

[Fondryman's handbook; general information on founding]Spravochnik liteishchika; obshchie svedeniia po lit'iu. [By]S.A.Alekseyev i dr. Pod obshchei red. N.N.Rubtsova. Moskva, Mashgiz, 1962. 524 p. (MIRA 16:1)

(Founding--Handbooks, manuals,etc.)

FROLOV, V.V., kand.tekhn.nauk, dotsent

Thermal diffusion and hydrogen desorption processes in hydride forming metals during fusion welding. Trudy MVTU no.106:5-37. '62. (MIRA 16:6)
(Titanium hydride—Thermal properties)
(Gases in metals)

PARAKHIN, V.A., kand. tekhn. nauk; FROLOV, V.V., dots., kand.tekhn. nauk; SHORSHOROV, M.Kh., dots., kand. tekhn. nauk; GOSPODAREVSKIY, V.I., inzh.; SUBBOTIN, Yu.V., inzh.; KURKIN, S.A., dots., kand. tekhn. nauk; VINOKUROV, V.A., dots.,kand. tekhn. nauk; KAGANOV, N.L., dots., kand. tekhn. nauk; SHASHIN, D.M., kand. tekhn. nauk; AKULOV, A.I., dots., kand. tekhn. nauk; NAZAROV, S.T., dots., kand. tekhn. nauk; YEVSEYEV, G.B., dots., kand. tekhn. nauk; NIKOLAYEV, G.A., prof., doktor tekhn. nauk, red.; TITOVA, V.A., red.; FUFAYEVA, G.I., red.; CHIZHEVSKIY, E.M., tekhn. red.

[Laboratory work on welding] Laboratornye raboty po svarke. Moskva, Rosvuzizdat, 1963. 274 p. (MIRA 16:8)

1. Nauchno-pedagogicheskiy kollektiv Kafedry svarochnogo proizvodstva Moskovskogo vysshego tekhnicheskogo uchilishcha (for all except Nikolayev, Titova, Fufayeva, Chizhevskiy).
2. Zaveduyushchiy kafedroy "Mashiny i avtomatizatsiya svarochnykh protsessov" Moskovskogo vysshego tekhnicheskogo uchilishcha (for Nikolayev).

(Welding—Study and teaching)

S/128/63/000/003/005/005
A054/A126

AUTHORS: Kurdyumov, A.V., Frolov, V.V.

TITLE: The duration of the effect of inoculation during vacuum treatment of the AJ 4 (AL4) alloy

PERIODICAL: Liteynoye proizvodstvo, no. 3, 1963, 41 - 42

TEXT: To avoid the formation of an acicular structure, the widely used AL4 alloy has to be modified by sodium salts. During th inoculation, however, the alloy adsorbs hydrogen resulting in a considerable porosity of the metal. Tests were carried out to establish a suitable refining method for this alloy, which would not weaken or shorten the effect of modification, by subjecting the alloy to vacuum treatment. In the tests the AL4 alloy, containing, besides Al, 9.9% Si, 0.25% Mg, 0.5% Mn and 0.4% Fe, was used. The degree of modification was assessed by the grain size of silicon in the eutectic (the bigger the grain size, the weaker the effect of inoculation). For modification the fluor and chlorine salts of sodium were used in a 2 : 1 ratio, amounting to 2% of the alloy quantity; samples were processed at temperatures between 750 and 810°C, and

Card 1/2

The duration of the effect of inoculation ....

in a vacuum of 10 and 20 mm Hg in the autoclave. The analysis of the fracture surface and microstructure of the specimens showed that the effect of sodium inoculation can be maintained for the longest time (20 - 30 min) and a dense metal structure can be obtained, if the AL4 alloy is vacuum-treated at 750 and 780°C ± ± 10°C in 10 - 20 mm Hg vacuum, due to which treatment the adsorbed gases are removed from the metal without weakening the effect of inoculation. There are 2 figures and 1 table.

Card 2/2

Dissertation: "An Investigation of the Flow in Short Cascades of Regulating Stages at High Speeds." Cand Tech Sci, Moscow Order of Lenin Power Engineering Inst imeni V. M. Molotov, 25 Jun 54. (Vechernyaya Moskva, Moscow, 16 Jun 54)

SO: SUM 318, 23 Dec 1954

Subject : USSR/Heat Engineering AID P - 4367

Card 1/1 Pub. 110-a - 12/19

Author : Frolov, V. V., Kand.Tech. Sci. Moscow Power Institute

Title : On improving the efficiency of a two-stage turbine rotor.

Periodical : Teploenergetika, 4, 48-50, Ap 1956

Abstract : A theoretical analysis of the efficiency of a two-stage rotor with a new blading design. Two Russian 1955 references.

Institution : None

Submitted : No date

Subject : USSR/Power Engineering AID P - 4377

Card 1/1 Pub. 110 a - 3/17

Authors : Deych, M. E., V. V. Frolov, Kand. Tech. Sci., and A. V. Gubarev, Eng., Moscow Power Institute

Title : Research on new shapes of cascades and pressure stages in turbines.

Periodical : Teploenergetika, 5, 13-22, My 1956

Abstract : Experiments with a series of bladings of new shapes including research at supersonic velocity, are described. Basic aerodynamic data of new blading are given. Mathematical analyzes of various control and pressure stages designs are presented. Twelve figures, 6 tables..

Institution : None

Submitted : No date

Subject : USSR/Engineering AID P - 5009

Card 1/1 Pub. 110-a - 11/17

Author : Frolov, V. V., Kand. Tech. Sci.

Title : The Swedish 9,000 kw gas turbine (News From Abroad)

Periodical : Teploenergetika, 9, 57, S 1956

Abstract : The characteristics of this gas turbine are given.

Institution : None

Submitted : No date

34665
S/114/62/000/001/002/006
E194/E455

26.2122

AUTHORS: Deych, M.Ye., Doctor of Technical Sciences, Professor,
Baranov, V.A., Candidate of Technical Sciences,
Frolov, V.Y., Candidate of Technical Sciences,
Filippov, G.A., Engineer

TITLE: The influence of blade height on certain characteristics of single-row turbine stages

PERIODICAL: Energomashinostroyeniye, no.1, 1962, 6-9

TEXT: This article describes work done in the Kafedra parovykh i gazovykh turbin (Steam- and Gas-Turbine Department) of the MEI. The notation used in the article is shown in Fig.1. The stages tested had a mean diameter d_{cp} = 400 mm and the value of the height l_1 ranged from 48 to 10 mm. The clearances had the following values: δ_1, 1.2 to 1.5 mm; δ_2, 3 mm; δ_3, 0.6 to 0.8 mm; δ_4, 1.5 mm. There were no equalizing holes in the disc. The stages were built up by combining a number of different types of runner and nozzle blades so that the effective blade length and other characteristics could be altered. Curves are plotted of stage efficiency and reaction as functions of the velocity ratio of

Card 1/2

u/c_o for stages having different blade lengths. The influence of blade to nozzle area F_2/F_1 on efficiency and the influence of the enclosed axial clearance δ_2 and of the Reynolds number with different blade lengths are also plotted. It is concluded that meridianal profiling of nozzle blading in stages with a height of 10 to 25 mm gives an appreciable increase in stage efficiency, of the order of 2 to 3%. In stages with this kind of profiling, there is almost no difference between the reaction at the blade tip and that at the blade root. When the blades are short, the efficiency falls off more rapidly than is the case with long blades if the velocity ratio is not of the optimum value, within the range of u/c_o = 0.4 to 0.58. Other things being equal, the mean stage reaction depends very much on the height of the blades, and it increases as the blades become shorter. When the blades are short the area ratio F_2/F_1 has less influence on the stage efficiency than when they are long. The magnitude of the optimum relative enclosed axial clearance δ_2 diminishes as the blades are shortened. The Reynolds number was found to have an influence on the optimum value of this clearance for stages with short blades.
Card 2/ 3

FROLOV, V. V. (Moskva)

Optimum formula for heat conducting fins taking into account mutual irradiation. Izv. AN SSSR. Otd. tekh. nauk. Energ. i avtom. no.6:45-49 N-D '62. (MIRA 16:1)

(Heat—Transmission) (Thermodynamics)

GRODZOVSKIY, G. L. and FROLOV, V. V.

"Optimum Contour Heat Rejection Fins Cooled by Radiation."

report presented at thel 13th Intl. Astronautics Congress, Varna, Bulgaria, 23-29 Sep 62.

GRODZOVSKIY, G. L.; STASENKO, A. L.; FROLOV, V. V.

"On the shape of heat rejection elements cooled by radiants."

report submitted for 15th Intl Astronautical Cong, Warsaw, 7-12 Sep 64.

L 24154-65 EPF(c)/EPF(n)-2/EPR/EWT(d)/EWT(l)/EWT(m)/EWP(k)/EPA(bb)-2/T/EWA(l)/EWP(w)/EWP(v) Pf-4/Pr-4/Ps-4/Pu-4 EM/KW

ACCESSION NR: AP5002221 S/0281/64/000/006/0750/0755

AUTHOR: Frolov, V. V. (Moscow)

TITLE: An optimum system of emitting fins

SOURCE: AN SSSR. Izvestiya. Energetika i transport, no. 6, 1964, 750-755

TOPIC TAGS: fin emitter, thermal radiation, optimum fin shape, fin base interaction, heat transfer

ABSTRACT: B. V. Karlekar and B. T. Chao (International J. of Heat and Mass Transfer, vol. 6, no. 1, 1963) previously solved a general problem concerning the optimum shape and number of thin trapezoidal radiating fins. In the present paper, the plane variational problem concerning the optimum profile of heat-removing fins is studied, taking into account the interaction of the fins with the base surface of the cooled regular prism for various degrees of blackness. The article also gives the optimum number of fins having the minimum total weight and the results of numerical calculations (for various values of the pertinent parameters) are plotted in the form of 10 graphs. It concludes with a comparison of the efficiencies of the optimum fins and the triangular and rectangular fins. Orig. art. has:

Card 1/2

L 24154-65

ACCESSION NR: AP5002221

18 formulas and 11 figures.

ASSOCIATION: None

SUBMITTED: 11Jan64 ENCL: 00 SUB CODE: TD

NO REF SOV: 004 OTHER: 011

Card 2/2

FROLOV, V. V., Cand Phys-Math Sci (diss) -- "Ionization methods of dosimetry of high-energy gamma rays in the energy band up to 250 Mev". Moscow, 1959. 16 pp (Min Higher and Inter Spec Educ RSFSR, Moscow Engineering-Phys Inst), 100 copies (KL, No 10, 1960, 125)

FROLOV, V. V.

PHASE I BOOK EXPLOITATION SOV/5717

Moscow. Inzhenerno-fizicheskiy institut.

Pribory i metody analiza izlucheniy; sbornik nauchnykh rabot, vyp. 2. (Apparatus and Methods for the Analysis of Radiation; Collection of Scientific Papers, no. 2) Moscow, Atomizdat, 1960. 166 p. 4000 copies printed.

Sponsoring Agency: Ministerstvo vysshego i srednego spetsial'nogo obrazovaniya RSFSR. Moskovskiy inzhenerno-fizicheskiy institut.

Ed. (Title page): Ye. L. Stolyarova, Candidate of Physics and Mathematics; Tech. Ed.: S. M. Popova.

PURPOSE: This collection of articles is intended for specialists in nuclear physics, dosimetry of nuclear radiations, and shielding.

COVERAGE: The articles were prepared by scientists of MIFI (Moscow Physics and Engineering Institute) and presented at the 1957 conference of the Institute. Brief annotations to the articles have been included in the Table of Contents. No personalities are mentioned. References follow each article.

Card 1/8

Kimel', L. R. Calculation of Gamma-Radiation Fields for Sources of Various Form With the Aid of Geometric Transformation of the Source Forms 47

It is shown that the transformation of sources from one geometrical form to another considerably simplifies the calculation of radiation doses in some cases and provides a method for calculating the dose from the source in cases for which analytical equations are not available.

Mashkovich, V. P. Heat Release in Shields From a Flux of Thermal Neutrons and Captured Gamma Rays 58

It is shown that calculations of thermal shielding for reactors must take into account the heat release in the shielding from the captured gamma rays inasmuch as it increases the total heat release by 60 to 70%.

Frolov, V. V. Phantom Dosimeter for Measuring the Absorbed Dose of Gamma Radiation of Unknown Spectral Composition Ranging in Energy to 250 Mev 65

Dosimetry principles for high-energy (to 250 Mev) gamma radiation are presented along with a description of a water phantom dosimeter and the results of its application to measuring the dose fields of bremsstrahlung generated by betatrons or a synchrotron.

Frolov, V. V. Thick-Wall Ionization Chamber for Measuring the Dose of High-Energy (35-300 Mev) Bremsstrahlung 91

It is shown that the electron balance required for measuring bremsstrahlung dosage in roentgens can be secured by choosing the thickness and material of the wall of the ionization chamber.

Ivanov, V. I. Calculation of Ionic Mobility in Dielectric Liquids 106

A method is described for calculating the mobility of solvated ions on the assumption that the mobility obeys Stokes law. The calculation results were in good agreement with experimental data. The results can be used in studying the possible application of liquid ionization chambers to dosimetric measurements.

Kovalev, Ye. Ye., and V. I. Popov. Determination of the Geometric Correction Factor for a Cylindrical Ionization Chamber 110

It is stated that the geometry in the experiment must be taken into account when measuring the dose rate of gamma radiation with a cylindrical chamber. A general equation for the correction of the geometric factor in

S/796/62/000/003/008/019

AUTHORS: Cherevatenko, G.A., Frolov, V.V.

TITLE: Calculation of a graphite ionization chamber for measurement of the intensity of bremsstrahlung in the 1- to 100-mev energy range.

SOURCE: Moscow. Inzhenerno-fizicheskiy institut. Pribory i metody analiza izlucheniy. no.3. 1962, 79-88.

TEXT: The paper expounds the calculation of the sensitivity of a thick-walled ionization chamber with graphite walls for γ-quantum energies of 1 to 100 mev, applicable in the measurement of flux intensities in synchrotron, betatron, and linear electron accelerators. From a knowledge of the sensitivity of the chamber for a given γ radiation and the ionization produced by that radiation in the gas contained within the chamber, the intensity of the impinging quanta can be readily determined. Basic premises: A plane system, consisting of a thick layer of graphite ($1.8\ g/cm^3$), contains an air-filled cavity at depth T. Compton scattering and pair formation are the predominant effects considered at the chosen energy level; the photoeffect is relegated to lower energy levels and is not considered. The effect of multiple scattering is briefly evaluated and is found to be small for a low-atomic-number substance such as graphite. The critical energy at which shower processes

Card 1/3

are probable within the walls is estimated to be 120 mev. Sensitivity calculation: The sensitivity of an ionization chamber, S(W), is defined as that share of the energy of the γ-quanta which is directly expended on the ionization in a unit volume of the chamber wall at the depth T when one γ-quantum per second impinges on 1 cm^2 of the frontal wall of the chamber. The calculation method is based primarily on Western references (Shuhl, C., J. Phys. radium, v. 17, no. 6 (suppl.), 1956, A97-A103; Flowers, B., et al., Roy. Phys. Soc., Proc., v. B65, 1952, 286-295; Lax, M., Phys. Rev., v. 72, 1947, 61-67) and V. V. Frolov's dissertation (MIFI //Moscow Engineering Physics Institute//, 1959). The basic term in S(W) is the function F(W), which characterizes the mean share of the energy of a γ-quantum that is directly expended on ionization upon a single collision of any kind, and which, in this instance, is divided into a Compton-scattering and a pair-formation term. Basic data for the first term are taken from the Shuhl reference, those for the second term from W. Heitler's formula and the Shuhl empirical straight-line approximation formula. The Compton-scattering cross-section appearing in the F(W) equation is expressed in accordance with the Klein-Nishina-Tamm concepts. The numerical results of the fairly cumbersome expression are tabulated and graphically plotted against energy for various values of T. The optimal sensitivity of a chamber for an unknown radiation spectrum is found to occur at one-half the energy of the upper boundary of the bremsstrahlen spectrum. Secondary processes: Consideration of secondary

Calculation of a graphite ionization chamber... S/796/62/000/003/008/019

Compton scattering is based on Shuhl and Flowers concepts; experimental evidence indicates absence of observable changes in measured ionization. Shower processes, according to the Frolov dissertation, should not introduce a more than 5% correction in the energy range up to 100 mev. The accuracy of the method set forth here should be ±10% for 3-100 mev for direct γ-quantum flows of unknown spectral composition. There are 5 figures, 1 (unnumbered) table, and 10 references (2 Russian-language Soviet and 8 English-language, including 2 in Russian translation).

ASSOCIATION: None given.

Card 3/3

FROLOV, V.V.

Scientific Conference of the Moscow Engineering and Physical Institute. Atom. energ. 15 no.6:533-534 D '63. (MIRA 17:1)

43352
S/170/62/005/012/005/008
B104/B186

AUTHORS: Broder, D. L., Kumuzov, A. A., Levin, V. V., Frolov, V. V.

TITLE: Using the method of removal cross sections for calculating a shield that contains no hydrogen

PERIODICAL: Inzhenerno-fizicheskiy zhurnal, v. 5, no. 12, 1962, 65 - 70

TEXT: Attenuation of a monoenergetic neutron flux in Al and in mixtures of Al containing equal portions of Pb and Fe was measured; also attenuation in an assembly of Al plates with Fe, Pb, plexiglass or polyethylene blocks placed between source and detector. The neutron sources used were the reactions $D^2(D,n)He$ (E_o = 4 Mev), $T^3(D,n)He^4$ (E_o = 14.91 Mev) and a U^{235} disk exposed to a thermal neutron flux extracted from the reactor of the first atomic power plant in the world. A fission chamber with Th^{232} was used as detector. Results: (1) the removal cross section method can be used to calculate a shield in which light substances are used instead of water; (2) in most cases the removal cross section depends on the moderator only slightly; (3) the removal cross section

Card 1/2

Using the method of removal ...

reaches saturation at relatively small distances from the source; (4) the measurements with a U^{235} fission chamber and those made with a Th^{232} fission chamber are consistent for boron carbide and water. (5) At a sufficiently large distance from the source theirecipro6al of the relaxation length is equivalent to the removal cross section of any given substance. There are 3 figures and 1 table.

SUBMITTED: July 30, 1962

X

Card 2/2

ACCESSION NR: AT4019031 S/0000/63/000/000/0052/0060

AUTHOR: Broder, D. L.; Kutuzov, A. A.; Levin, V. V.; Frolov, V. V.

TITLE: Application of the "removal cross section" method to the computation of non-hydrogen-containing shielding

SOURCE: Voprosy* fiziki zashchity* reaktorov; sbornik statey (Problems in physics of reactor shielding; collection of articles). Moscow, Gosatomizdat, 1963, 52-60

TOPIC TAGS: nuclear reactor, reactor shielding, iron shielding, lead shielding, non-hydrogenous shielding, removal cross section, neutron, neutron spatial distribution, neutron decelerator, aluminum shielding, boron carbide

ABSTRACT: The authors first briefly describe the removal cross section method for the computation of the spatial distribution of neutron streams in hydrogen-containing shielding. Some of the limitations of the method are discussed along with an analysis of the difficulties often encountered in its application (for example, in homogeneous mixtures). The hypothesis has previously been advanced that, by prescinding from the question of the accumulation of low-energy neutrons, the removal cross section technique might be applied to media

Card 1/4

ACCESSION NR: AT4019031

containing other light decelerators in place of hydrogen. In these previous investigations, boron carbide in a mixture with iron and lead was studied as the decelerator. Some of the findings of this research are discussed in the present article, which also gives additional experimental data which prove the feasibility of extending and generalizing the removal cross section method to heavier slowing media. Aluminum was employed as the decelerating medium in the tests reported on in this paper. Neutron sources with E = 4 Mev and 14.9 Mev were used. In addition, measurements were made of the removal cross sections of iron and lead in boron carbide in the fission neutron spectrum and the removal cross section of iron in the spectrum of the VVR reactor. As neutron sources the authors used the reactions D (d, n) He^3 with an initial neutron energy of E = 4 Mev, and T (d, n) He^4 (E = 14.9 Mev), and also a disk of U^{235} removed from the reactor of the Pervoy v mire atomnoy elektrostantsii (World's First Atomic Power Station) and placed in a stream of thermal neutrons. The sources were in the form of disks with a diameter of 10 cm for the mono-energetic neutron sources, and 46 mm for the fission spectrum source. Fast neutrons were detected by means of a fission chamber with Th^{232}. Further details on the experimental apparatus are given in the article. Graphs are presented showing the spatial distribution of the fast

Card 2/4

ACCESSION NR: AT4019031

neutrons in different substances and mixtures, as well as the dependence of the removal cross sections of iron and lead in aluminum (and of polyethylene and plexiglass in aluminum) for neutrons with E = 4 Mev and 14.9 Mev on various controlled experimental factors (distance between source and detector, distance between block of removed material and detector, etc). A table is given showing removal cross sections measured in water, boron carbide and aluminum. It is shown that the removal cross section method is applicable to the computation of shielding in which other light media are employed as decelerators in place of water: for example, boron carbide or aluminum. The magnitude of the removal sections for the majority of the substances tested depends only slightly on the choice of the decelerating medium. If a light component is lacking in the shielding, the authors found that the use of the removal cross section method is possible provided the removal cross section of the material in the given medium is known or if the lower boundary of the energy group is substantially raised. Several other significant conclusions are discussed in the article. "The authors thank V. P. Bogdanov, S. G Osipov, G. V. Ry*kov, V. S. Tarasenko and A. I. Chusov for taking part in the measurements."

Card 1 3/4

ACCESSION NR: AT4019031

ASSOCIATION: none

SUBMITTED: 14Aug63 DATE ACQ: 27Feb64 ENCL: 00

SUB CODE: NP NO REF SOV: 007 OTHER: 003

Card 4/4